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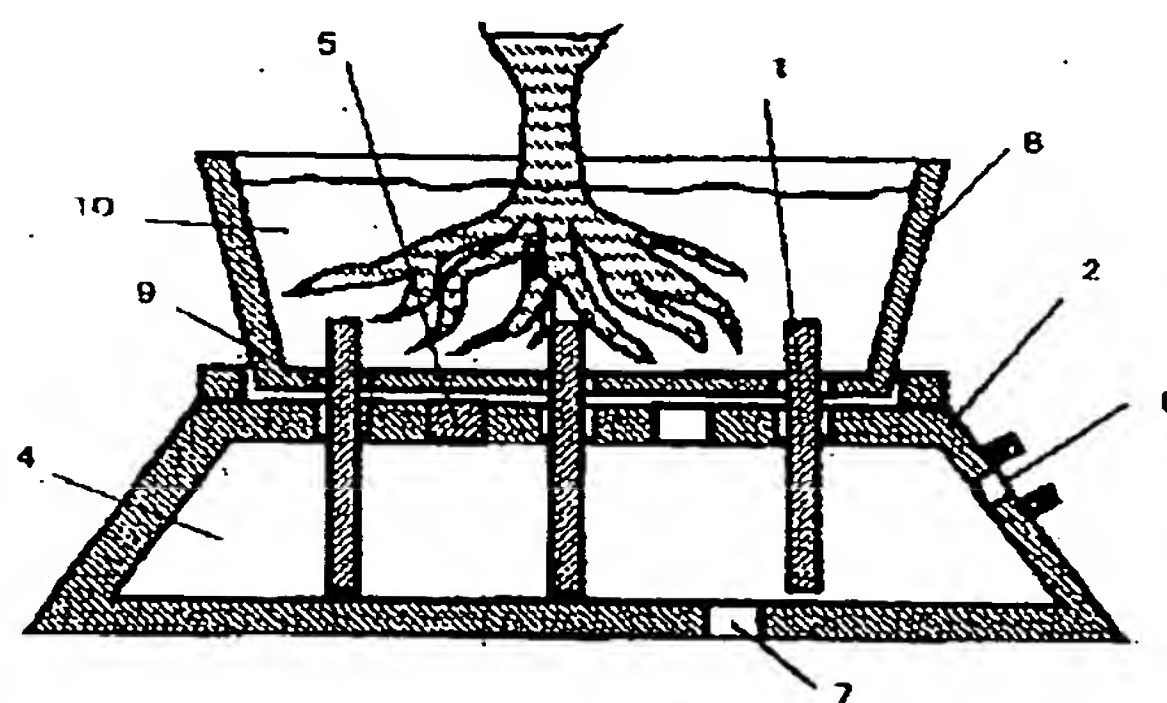
54 Title of the Invention

Method of Supplying and Retaining Water for Potted Plants

57 Abstract

**Objective** The present invention provides a method of supplying and retaining water for potted plants, particularly to *bonsai* plants that must be watered every day, without the roots of the plants withering when water is not supplied when the owner is absent for several days, and without continuously immersing the roots of the plant in water, but without eliminating the capacity of the roots to absorb moisture.

**Design** The lower ends of fired diatomaceous earth rods possessing communicating porosity of not less than 50% and an apparent unit density of less than 1 g/ml are fired into cylindrical rods



and are inserted into a water holding tank, and by inserting the upper ends of the fired diatomaceous earth rods into the soil from the drainage orifice in the base of a flowerpot, the water in the water holding tank passes through the diatomaceous earth rods and is absorbed and supplies water to the roots of the plant inside the pot from the bottom of the flowerpot.

## Claims

**Claim 1** A method of supplying and retaining water for potted plants, such method characterized by a water supply part in which the lower ends of fired diatomaceous earth rods possessing communicating porosity of not less than 50% and an apparent unit density of less than 1 g/ml are fired into cylindrical rods and are inserted into water holding tanks, and in that, by inserting the upper ends of the fired diatomaceous earth rods into the soil from the drainage orifice in the base of a flowerpot, the water in the water holding tank passes through the diatomaceous earth rods and is absorbed and supplies water to the roots of the plant inside the pot from the bottom of the flowerpot.

**Claim 2** A method of supplying and retaining water for potted plants, such method characterized in that diatomaceous earth that possesses an apparent unit density of less than 1 g/ml and a communicating porosity of not less than 50% is shaped into the form of the teeth of a comb and fired, and in that the teeth of the comb are so disposed as to pass through the drainage orifices in the base of a plant pot which is provided with a plurality of drainage orifices, the interior of the plant pot being filled in from above, and in that the lower ends of the teeth of the comb being inserted in a water holding tank forming a water supply part, and in that water is supplied by the water in the water holding tank passing through the diatomaceous earth.

**Claim 3** A method of supplying and retaining water for potted plants, such method characterized by a water supply part in which the lower ends of fired diatomaceous earth rods possessing communicating porosity of not less than 50% and an apparent unit density of less than 1 g/ml are fired onto cylindrical rods and are inserted into water holding tanks, and in that the other ends of the rods of diatomaceous earth are inserted into the soil in the pot whereby the water in the water holding tank passes through the rods of diatomaceous earth and water is supplied.

## Detailed description of the invention

### Relevant area of industry

This invention relates to a method of supplying and retaining water for potted plants, which is able to supply water to the roots of plants in pots or planters for a fixed period of time and is able to prevent the withering of the roots of the plants.

### Prior art

Hitherto, owners of potted plants employed automatic watering devices to supply water to the potted plants or employed water retaining sheets at the base of the pots, or mixed water-absorbent polymers into the soil and so forth when the owners of the potted plants

were absent due to travel and so forth in order to prevent the roots of the potted plants from withering.

However, automatic watering devices are appropriate for nurseries and the like which have large numbers of plants, but are not efficient for the watering of plants grown for pleasure on the domestic scale.

Moreover, when the water-retaining sheet method and the method of mixing water-absorbent polymer in the soil are employed, the roots of the plant are continuously immersed in water, and if particularly large amounts of water-absorbent polymer pellets are employed, plants readily develop root rot, while, because the roots of the plant are continuously immersed in water, the capacity of the plants to absorb water through their own efforts is weakened and so forth, thus producing deleterious effects for the plant.

#### **Problems addressed by the present invention**

It is an objective of the present invention to provide a method of supplying and retaining water for potted plants, particularly to *bonsai* plants that must be watered every day, without the roots of the plants withering when water is not supplied when the owner is absent for several days, and without continuously immersing the roots of the plant in water, but without eliminating the capacity of the roots to absorb moisture.

#### **Means employed in order to overcome these problems**

In order to achieve this objective, the present invention provides a water supply and retention part in which rods of diatomaceous earth having an apparent unit density of less than 1 g/ml and a communicating porosity of not less than 50% are fired into cylindrical rods, or alternatively diatomaceous earth is formed into the teeth of a comb, and the lower ends thereof are inserted into a water holding tank, with the upper ends of the diatomaceous earth being inserted through the drainage orifices in the base of the potted plant into the soil, or alternatively, the diatomaceous earth in the form of the teeth of a comb being previously inserted into the plant pot, whereby the water in the water holding tank passes through the diatomaceous earth and is absorbed and lifted up, and water is supplied to the roots of the plant in the pot from the bottom of the pot.

The positions at which the diatomaceous earth rods are inserted into the water holding tank may be set according to the position of the water drainage orifices in the base of the plant pot that is disposed over the water holding tank, while the orifices may be opened by punching and so forth in the structure at the top of the water holding tank at positions corresponding to the positions of the teeth of the diatomaceous earth that is formed into the teeth of a comb, while those positions other than the insertion points may effectively be covered. Moreover, the orifices that are punched in the cover can also be employed as aeration orifices for the tank.

The material of which the water holding tank is formed may be metal, reinforced plastic or hard vinyl chloride and so forth, and the water holding tank may be so machined as to withstand the mass of the pot.

Moreover, diatomaceous earth possessing an apparent unit density of less than 1 g/ml and a communicating porosity of not less than 50% is employed for the material of the

cylindrical fired rods or alternatively the teeth of the comb because diatomaceous earth within this range is highly permeable and is also porous and hence possesses excellent water retention properties.

The fired rods that form the water retention and supply material from the water holding tank are cylindrical because the water drainage orifices in the base of the plant pot are circular, and moreover, if the rods were made rectangular, the corners would catch and result in damage when the rods were inserted from the base of the plant pot. Thus a cylindrical shape without corners is employed.

The cylindrical fired rods or fired teeth of a comb may be manufactured by methods known to the art, such as by kneading the diatomaceous earth and forming it in a mould and firing it in a kiln, or alternatively by employing a diamond cutter or the like to cut the patters from fired bricks, and so forth.

Moreover, one of the fired diatomaceous earth rods possessing an apparent unit density of less than 1 g/ml and a communicating porosity of not less than 50% that have been fired into cylinders is inserted into the water holding tank and forms the water retention and supply part, while the other end of the fired diatomaceous earth rods is inserted into the soil inside the plant pot, whereby the water in the water holding tank passes through the fired diatomaceous earth rods and soaks from the top of the plant pot into the soil, supplying water to the roots of the plant, thereby forming the method of retaining and supplying water to potted plants.

Moreover, when the method of causing water to soak into the soil from the top of the plant pot is employed, that portion of the cylindrical fired rods that is outside the soil may be prevented from coming into direct contact with the air by means of vinyl coatings and the like, which restricts the evaporation of the water from that portion and is also effective in extending the service life of the cylindrical fired rods.

#### **Mode of implementation of the invention**

The mode of implementation of the present invention is described by means of reference to practical embodiments of the invention. The practical embodiment of the invention, illustrated in:

Figure 1, shows the water retention and supply part of the water retention and supply method for plant pots of Claim 1, in which the lower ends of the cylindrical fired diatomaceous earth rods 1 are inserted into the water holding tank 2 from the upper insertion orifices 3 of the water holding tank 2, and the water 4 in the water holding tank 2 passes through the fired diatomaceous earth rods 1 and is absorbed and taken upwards.

In Figure 2, a plurality of orifices 3 is provided in the practical embodiment of the top of the water holding tank in order to correspond to the different positions of the water drainage orifices in different plant pots, and covers 5 are provided for each of the orifices in order to restrict the evaporation of the water 4 in the water holding tank 2.



The practical embodiment illustrated in Figure 3 shows a method of retaining and supplying water by inserting the water retention and supply part from the drainage orifices 9 of the plant pot 8 into the soil 10.

The practical embodiment illustrated in Figure 4 shows the plant pot water retention and supply method employing the teeth of a comb-shaped fired diatomaceous earth.

The practical embodiment illustrated in Figure 5 illustrates the water retention and supply method in which the water retention and supply part is inserted from the top of the plant pot 8 into the soil 10.

### **Effects of the invention**

This invention, which is designed as described above, provides the following benefits.

In the methods of water retention and supply from the top and from the bottom of the plant pot, the water retention and supply part can easily be attached to the base of the plant pot, and even when water is retained and supplied over a long period of time, only that amount of water that is absorbed by the roots of the plant is supplied, thus avoiding a situation in which the roots of the plant are continuously immersed in water, and thus prevents the withering of the roots.

Moreover, in the method of retention and supply of water from the bottom of the plant pot, when water is sprinkled from the top of the pot, the water bearing nutrients passes through the cylindrical fired diatomaceous earth rods or alternatively the fired diatomaceous earth in the form of the teeth of a comb that are inserted into the drainage orifices in the base of the plant pot, and is captured in the water holding tank, thus effectively preventing the wasting of water.

Furthermore, because the roots of the plant are not continuously immersed in water, the capacity of the roots of the plant to absorb water is not reduced, and hence the roots of the plant are invigorated.

By adjusting the amount of water in the water holding tank, the plant is automatically supplied with water over long periods of time even when no person waters the plant, and hence the roots of the plant do not wither.

For these reasons, the method envisaged by the present invention prevents the withering of the roots of plants that must be watered every day and also prevents root rot and loss of the capacity of the roots to absorb water due to over-watering, and thus is able to provide a method of supplying and retaining water for potted plants which invigorates potted plants.

### **Simplified description of the drawings**

Figure 1 is a cross-sectional drawing of a practical embodiment of the method of supplying and retaining water for potted plants envisaged by the present invention.

Figure 2 is a plan elevation of a practical embodiment of the water holding tank part for the base of the plant pot.

Figure 3 is a cross-sectional drawing of the mode of use of the water retention and supply part at the base of the plant pot.

Figure 4 is a cross-sectional drawing of the mode of use of the water retention and supply part at the top of the plant pot.

Figure 5 is a cross-sectional drawing of the mode of use of the water retention and supply part at the top of the plant pot.

**Explanation of symbols**

- 1 ... Cylindrical fired diatomaceous earth rod;
- 2 ... Water holding tank;
- 3 ... Insertion orifice in top of water holding tank;
- 4 ... Water;
- 5 ... Cover;
- 6 ... Water insertion orifice;
- 7 ... Water drain;
- 8 ... Plant pot;
- 9 ... Water drainage orifice;
- 10 ... Soil;
- 11 ... Vinyl coating and the like

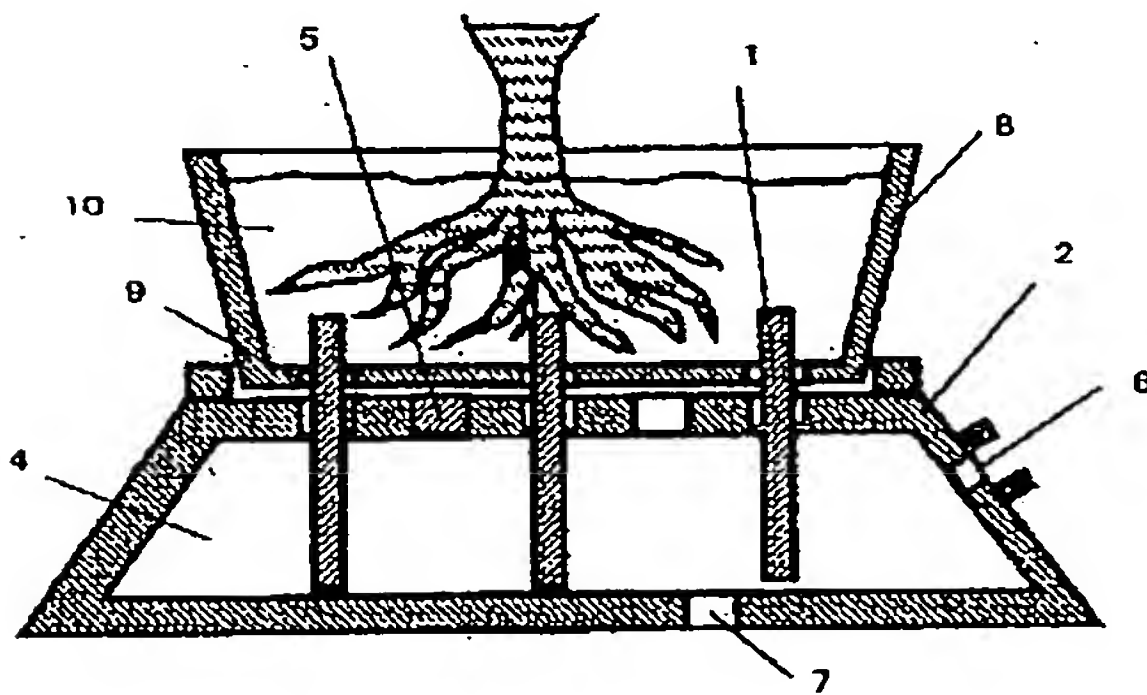


Figure 1

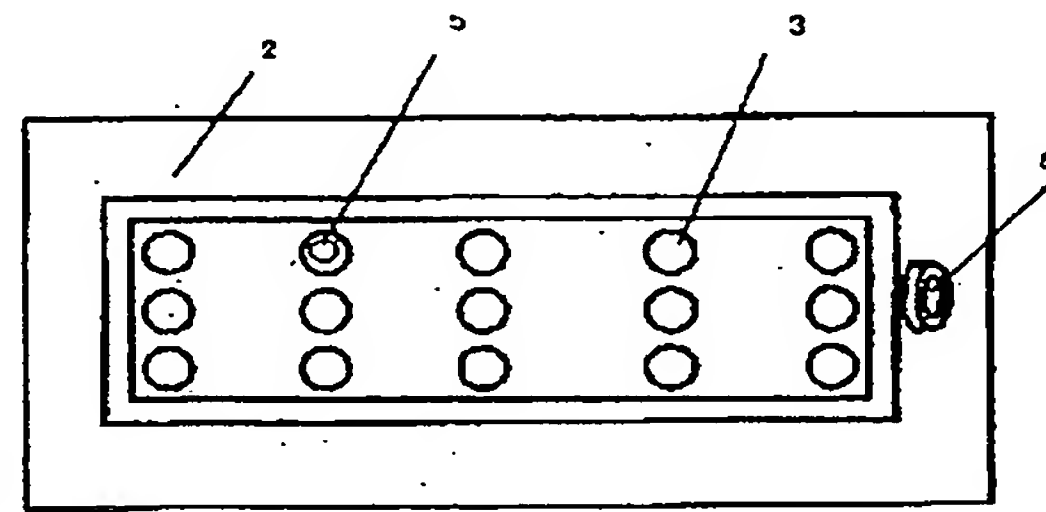


Figure 2

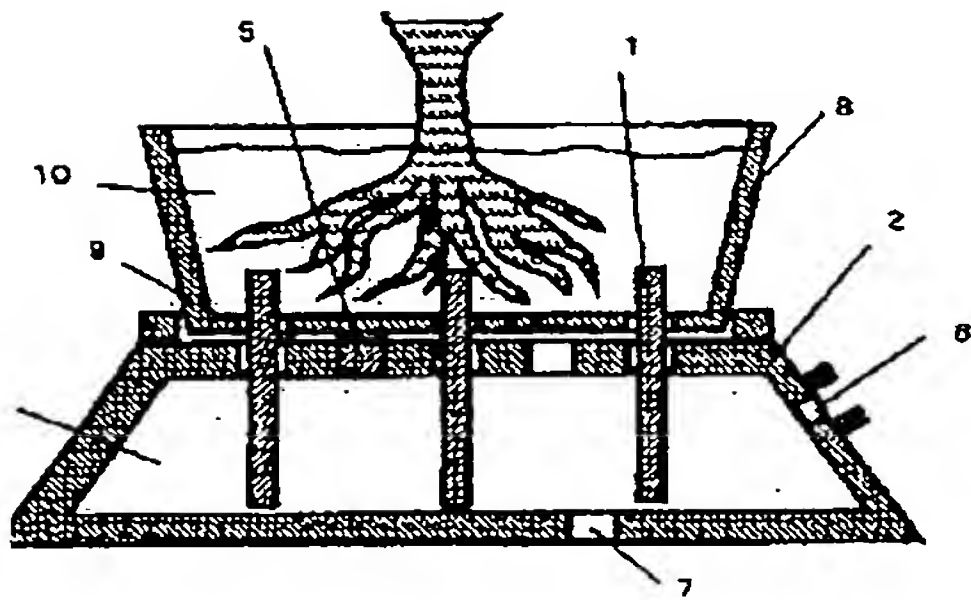


Figure 3

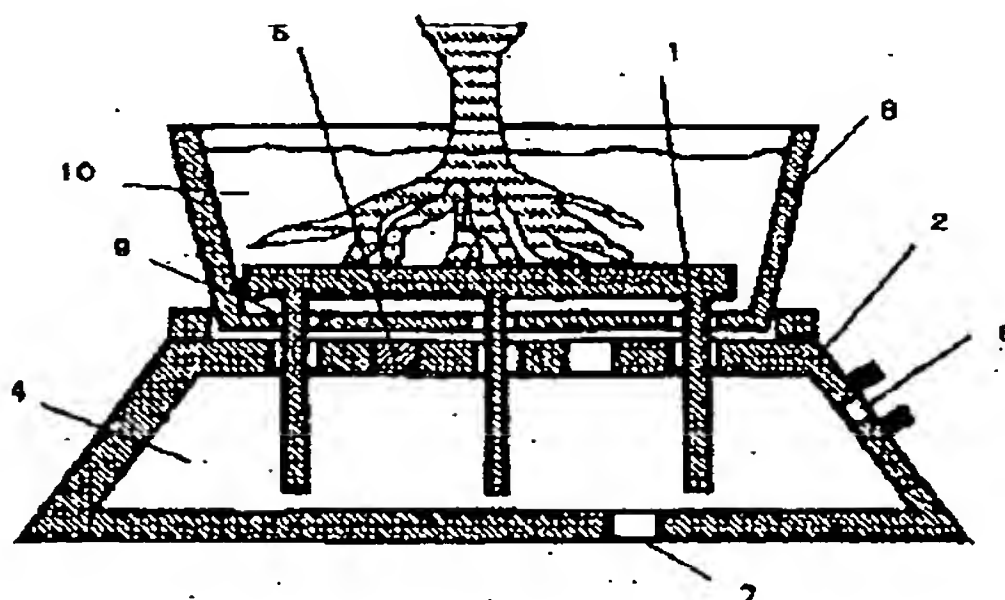


Figure 4

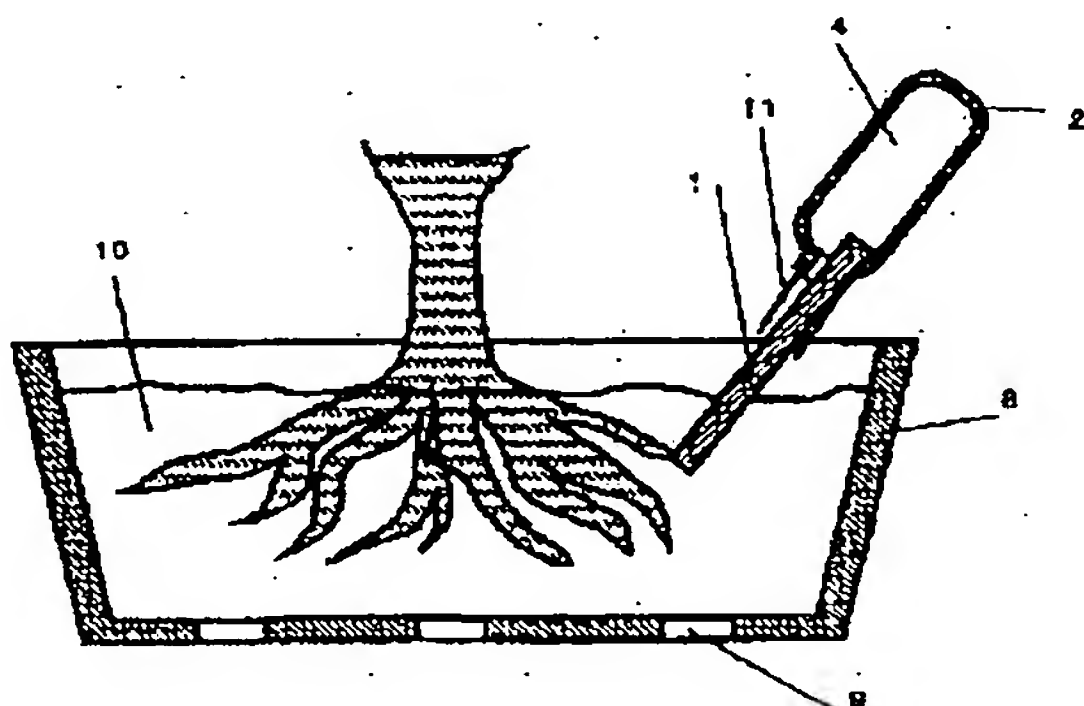


Figure 5